

angles, the diagonal arches which mark their intersection will be each the half of an ellipse, in a vertical plane inclined to the walls of the building at an angle of 45 degrees, and having its axis major, which will be horizontal, to its axis minor, which will be vertical, in the ratio of $\sqrt{2}:1$.^{*} If any other ellipse be used for this diagonal arch, or an ellipse whose plane inclines to that of the side walls in any other angle than that of 45 degrees, either the transverse arch, or that of the cellular vault, or both, must be elliptical, instead of semicircular; that is, if the springs are of the same height, and the ridges horizontal. This will be the case when the vaulting cells are narrower than the main vault. If the transverse arch be a circle, and the plane of the diagonal ellipse be inclined to the walls at an angle greater than 45 degrees, the arch of the cell will be half an ellipse whose axis major is vertical, or whose curvature increases from the spring to the vertex. If the cells have a semicircular arch, the transverse arch will be half an ellipse, but its axis minor will be vertical, or the curvature least, at and near the vertex. This, if I remember, is the case at Laach Abbey, in Germany; also in the crypts at Gloucester. If, now, the ridge of the vault be not taken exactly at the highest part of the circle, but at a distance from it, so as to form a pointed arched vault, the ridge of both the main and cellular vaults being kept horizontal, and at right angles to each other, the rule is not altered, but if the plane of the diagonal ellipse be inclined in any other angle than that of 45 degrees to the walls, the transverse arch, or that of the cellular vault, or both, must consist of elliptical instead of circular segments; and if the curvature increase towards the vertex of the arch, its form will not be so graceful as one in which the curvature diminishes in ascending. The exigencies therefore of unequal vaults, though they may have given rise to pointed arches, still demanded many more modifications of line and surface. The simple introduction of a pointed arch would not of itself have solved the difficulty. Either elliptical, transverse, or cellular arches, or inclination of the ridges, or elevation of the springs, or depression of the vertex, or some variation of surface, must have been necessary. In some early English works I think the elliptical form of the cellular arch is very apparent, and not graceful.

Now this may account for a variety which occurs in Decorated or Early Perpendicular work, where the cellular vault branches from the principal one at a point lower than the vertex, thus leaving a portion of the barrel roof unbroken. By this means diagonal arches, or rather portions of them, which shall satisfy the conditions of both the form and inclination of the ellipse belonging to arches of circular lines, will be obtained; and the cellular arch, though smaller than the transverse, will be equally made up of pure circular arcs. We have this kind of vaulting in the nave of Winchester Cathedral, and of Tewkesbury Church; in each of which none of the numerous ribs and bosses which cover a comparatively simple surface, will be found to be without meaning. But a still farther advance may be made. Let a point be taken in the ridge of the cellular vault, and joined with its spring by a portion of an arch, and also draw an arch from the spring to the point in the ridge of the main vault which corresponds with that of the cellular vault, that is, lying in the same vertical plane, and cut away the angle of the original roof between the two, so as to form an inclined ridge between the vertex of the principal vault and the point taken in the ridge of the cellular one, and an oblique face of roof, between the main and the cellular vaults. This forms a beautiful vault, which occurs (not to name other instances) in the transepts of Tewkesbury Church, in Gloucestershire; and you will observe, it may be constructed to satisfy the following conditions:—

That the ridge of the principal, or longitudinal vault, shall be perfectly horizontal;

That the transverse arches of both the principal and cellular vaults shall consist of simple circular segments;

That all the edges between different surfaces

shall lie in vertical planes, forming portions of true arches;

And, that all the surfaces shall be developable—a condition favourable, though not essential, to the beauty of the roof, and, I should suppose, convenient in its construction.

The number of oblique faces may be multiplied, even without the introduction of any other kind of surface, so long as we preserve unbroken the portion of the principal vault which is left in the foregoing construction.

But if we wish to infringe upon this by an oblique face, and yet keep the main ridge horizontal, we must introduce another description of surfaces, which shall neither correspond with the principal or cellular vaults nor with the oblique vaulting surfaces, but connect the latter with each other and with the former. I shall not attempt to enter into an investigation of their various forms or inclinations, but merely observe that they will mostly be found to be flatter, or less inclined to the horizon, than the surfaces of the original simple vault which they replace.

Though the oblique surface was probably first introduced for the purpose of connecting the ridges of two vaults unequal in height and span, the beauty of the effect thus obtained led to its use where this inequality did not exist, and it may perhaps be found to have facilitated the combination of vaults of different span, but equal height, without the abandonment of circular lines in the arch.

OXFORD CASTLE

Afforded the Rev. Mr. Hartshorne a subject. The keep still remains; it is singular from its rude construction and the amount to which the walls of it *batter*. The absence of mention of any military building here in "Domesday Survey," leads to the inference that it was erected after the date of that book. There was a castle here when the Empress Matilda was besieged by King Stephen in 1142. There is no reason to doubt that the earliest parts of the structure remaining were then in existence. Judging, too, from those general inductions architectural observers have laid down as a guide for determining dates, there is enough to be seen in that part of the building erroneously called "Maud's Chapel," to show that it belongs to the end of the eleventh or very beginning of the twelfth century, between 1087 and 1135. The mound is much earlier, and before the Saxon period, but the remains within it belong to the time of Henry the Third; so that here may be seen what preceded the Mercians, and the latest remains erected by the Plantagenets. The Crypt, commonly called Maud's Chapel, is a most interesting example of early Norman work. The vaulting is bold, and the voussoirs are carefully worked with stools. The capitals of the piers are highly curious. It was in all probability the crypt under the great hall.

"During the absence of the court, the castle was left in the custody of the sheriff, who superintended all the necessary works, and so slightly were parts of it built that there are precepts almost annually recurring, which show that repairs were essential very soon after the buildings themselves were first raised. This slight and defective mode of construction was not, however, peculiar to Oxford, but must be rather regarded as a characteristic of the military buildings of the period: all of them exhibit sufficient evidence of the negligent way in which castles were built. And if the proof were not too frequently before the eyes, a glance over some of the rotulets of the Great Roll of the Pipe would confirm the assertion, since it tells us that even the Castle of Oxford, which was commenced in (12 Hen. II.) 1166, and finished in 1173, substantial and perfect as it now looks, wanted reparation within the first fifteen years."

Professor Willis's Discourse on the Architectural History of Christ Church Cathedral was given, partly in the Sheldonian Theatre and partly in the building. It was a very pleasant narration, delivered with that clearness and sparkle which characterize the professor; but to those who had not heard his previous essays, Lord Northampton's statement made at the close, that not merely the popularity of the Institute, but its very exist-

ence, was owing to Mr. Willis's papers, must have sounded oddly.

He said very frankly at starting that the cathedral was unworthy of the city, and a disgrace to the University. We may briefly remind our readers that a convent was endowed here early in the eighth century by Didan, whose daughter Frideswide played a prominent part. It was probably dedicated to her in 1280, when her relics were removed from one part of the building to another. None of the Saxon work remains: the earliest portions belong to the Norman period. Some had thought, Mr. Willis said, that the lower pier arches belong to an earlier construction, but by taking off the lead covering of the aisles, he was enabled to prove that these upper and lower arches, bizarre as the arrangement was, were of the same period. The chapel on the north side of the choir, usually called Lady Montacute's Chapel, he considered was the Lady Chapel, a supposition strengthened by the fact that one of the bosses displayed a bunch of roses and another consisted of lily leaves, both emblems of the Virgin Mary. Relative to the conversion of monasteries into colleges, the lecturer said St. John's at Cambridge was an early instance. The change was quietly effected at Magdalen, Oxford, in 1456. Jesus College, Cambridge, was founded in the same way in 1496. Christ Church, Oxford, of which he was speaking, was founded on the ruins of several monasteries, including that of St. Frideswide. He concluded by quoting a passage from Wood, asserting the danger of following the fashion of the time in making restorations. In Salisbury Cathedral, the lecturer said, every tomb had been treated as a piece of furniture,—cleaned and altered.

The Chapter House at Christ Church is an exceedingly interesting early English apartment, at present divided and mis-fitted-up. It is hoped that it will one day be set right again. We wanted to say something of a pleasant excursion or two, but cannot now afford more space.

ON THE LIFE, PROFESSIONAL WORKS, WRITINGS, AND CHARACTER OF JOHN CARTER, F.S.A. AND DRAUGHTSMAN.

THAT the present generation of Archaeologists is deeply indebted to John Carter, cannot be disputed or denied. Like his predecessors, Camden, Aubrey, Dugdale, Stukeley, and others, he did his best, in his peculiar sphere, to lay the foundation for that branch of science and art which he loved to cultivate; and but for his labours we should have been ignorant of many interesting ancient objects which since his time have been entirely destroyed. It has always been a gratification to me to acknowledge obligations to by-gone labourers in the Topographical and Archaeological vineyard. To Aubrey, who was a native of the parish which gave me birth, I have devoted a goodly sized quarto volume, in which I have endeavoured to vindicate his memory from the captious censures of his ungenerous and unjust rival, Anthony a'Wood, as well as from the unfair and sneering criticisms of more recent writers, who have betrayed their ignorance of his real merits. Possessing a large mass of manuscript journals, letters, and papers, by Dr. Stukeley, I have long meditated on and hoped to produce such a memoir of that zealous, industrious, and learned antiquary, as would at once do him justice, and form a valuable contribution to our biographic annals. And I may venture to say, from a personal acquaintance of some years with the late John Carter, from having studied all his published works, and from repeated examinations of a large collection of his sketches and drawings (in my possession), that I feel qualified to describe his personal characteristics, as well as to appre-

^{*} It is essential to the beauty of a roof that the diagonals should have no double curvature, nor lie in a plane parallel to the horizon, but be inclined to the vertical arches.